

# Digital Panel Meter K3TE

## Easy-to-use, Low-cost Digital Panel Meter that Accepts DC Input

- Compact DIN-size (96 x 48 (W x H)) body.
- Mounting thickness of only 3.5 mm required.
- Highly visible display with 14.2-mm-high LEDs.
- Easy-to-mount snap-in construction.
- Conforms to EMC standards EN61010-1 (IEC61010-1).



CE

## Model Number Structure

### ■ Model Number Legend

K3TE -      
          1    2    3    4

#### 1, 2. Input Code

V1:  $\pm 199.9$  mV  
V2:  $\pm 1.999$  V  
V3:  $\pm 19.99$  V  
V4:  $\pm 199.9$  V  
A1:  $\pm 199.9$   $\mu$ A  
A2:  $\pm 1.999$  mA  
A3:  $\pm 19.99$  mA  
A4:  $\pm 199.9$  mA  
A5:  $\pm 1.999$  A

#### 3. Series No.

1: Current series

#### 4. Supply Voltage

4: 100 to 120 VAC  
5: 200 to 240 VAC  
6: 24 VDC (internally insulated)

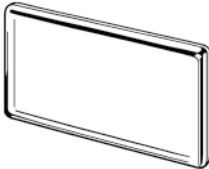
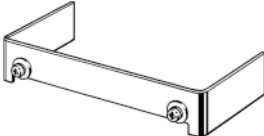
## Ordering Information

### ■ List of Models

| Range      | Measuring ranges | Supply voltage |                |                                  |
|------------|------------------|----------------|----------------|----------------------------------|
|            |                  | 100 to 120 VAC | 200 to 240 VAC | 24 VDC<br>(internally insulated) |
| DC voltage | ±199.9 mV        | K3TE-V114      | K3TE-V115      | K3TE-V116                        |
|            | ±1.999 V         | K3TE-V214      | K3TE-V215      | K3TE-V216                        |
|            | ±19.99 V         | K3TE-V314      | K3TE-V315      | K3TE-V316                        |
|            | ±199.9 V         | K3TE-V414      | K3TE-V415      | K3TE-V416                        |
| DC current | ±199.9 μA        | K3TE-A114      | K3TE-A115      | K3TE-A116                        |
|            | ±1.999 mA        | K3TE-A214      | K3TE-A215      | K3TE-A216                        |
|            | ±19.99 mA        | K3TE-A314      | K3TE-A315      | K3TE-A316                        |
|            | ±199.9 mA        | K3TE-A414      | K3TE-A415      | K3TE-A416                        |
|            | ±1.999 mA        | K3TE-A514      | K3TE-A515      | K3TE-A516                        |

**Note:** The K3TE-V4□□ does not conform to CE marking standards.

### ■ Accessories (Order Separately)

| Name                             | Appearance   | Model     |
|----------------------------------|--|-----------|
| Water-resistive Soft Front Cover |   | K32-L49SC |
| Water-resistive Mounting Bracket |  | K32-L49MB |

**Note:** Be sure to use the Soft Front Cover and Mounting Bracket as a set.

# Specifications

## ■ Ratings

|                              |  |  |  |
|------------------------------|--|--|--|
| Supply voltage               | 100 to 120 VAC; 200 to 240 VAC (50/60 Hz); 24 VDC (internally insulated)   |  |  |
| Operating voltage range      | -15% to +10% of supply voltage   |  |  |
| Power consumption            | 3 VA (at max. AC load); 1.3 W (at max. DC load) (see note)   |  |  |
| Insulation resistance        | 10 M $\Omega$ min. (at 500 VDC) between external terminal and case   |  |  |
| Dielectric strength          | AC model: 2,000 VAC min. for 1 min between input terminal and power supply<br>DC model: 500 VDC min. for 1 min between input terminal and power supply<br>AC/DC model: 2,000 VAC min. for 1 min between external terminal and case |  |  |
| Noise immunity               | AC model: $\pm$ 1,500 V on power supply terminals in normal or common mode<br>DC model: $\pm$ 480 V on power supply terminals in normal mode<br>$\pm$ 1,500 V on power supply terminals in common mode                             |  |  |
| Vibration resistance         | Malfunction: 10 to 55 Hz, 0.5-mm single amplitude for 10 min each in X, Y, and Z directions<br>Destruction: 10 to 55 Hz, 0.75-mm single amplitude for 2 hrs each in X, Y, and Z directions   |  |  |
| Shock resistance             | Malfunction: 98 m/s <sup>2</sup> for 3 times each in 6 directions<br>Destruction: 294 m/s <sup>2</sup> for 3 times each in 6 directions  |  |  |
| Ambient temperature          | Operating: -10° to 55°C (with no icing)<br>Storage: -20° to 65°C (with no icing)   |  |  |
| Ambient humidity             | Operating: 35% to 85% (with no condensation)   |  |  |
| Ambient operating atmosphere | No corrosive gas   |  |  |
| EMC                          | (EMI)  | EN61326+A1                             | Industry   |
|                              | Emission Enclosure:  | CISPR 11 Group 1 class A: CISRP16-1/-2 |  |
|                              | Emission AC Mains:   | CISPR 11 Group 1 class A: CISRP16-1/-2 |  |
|                              | (EMS)  | EN61326+A1                             | Industry   |
|                              | Immunity ESD:  | EN61000-4-2:                           | 4 kV contact discharge (level 2)<br>8 kV air discharge (level 3) |
|                              | Immunity RF-interference:  | EN61000-4-3:                           | 10 V/m (amplitude-modulated,<br>80 MHz to 1 GHz) (level 3)       |
|                              | Immunity Fast Transient Noise:   | EN61000-4-4:                           | 2 kV (power line) (level 3)                                      |
|                              | Immunity Burst Noise:  |  | 1 kV line to line (I/O signal line)                              |
|                              | Immunity Surge:  | EN61000-4-5:                           | 1 kV line to line<br>2 kV line to ground (power line)            |
|                              | Immunity Conducted Disturbance   | EN61000-4-6:                           | 3 V (0.15 to 80 MHz) (level 2)                                   |
|                              | Immunity Voltage Dip/Interrupting  | EN61000-4-11:                          | 0.5 cycles, 0, 180°, 100% (rated voltage)                        |
| Approved standards           | Conforms to EN61326+A1, EN61010-1 (IEC61010-1)<br>Conforms to VDE0106/P100 (finger protection) when the terminal cover is mounted.   |  |  |

- Note:** 1. An inrush current of approximately 0.5 A will flow at the moment the power is turned on and continued for approximately 2 ms.  
2. The K3TE-V4□□ does not conform to CE marking standards.

## ■ Characteristics

|                                |   |
|--------------------------------|---|
| Input signal                   | DC voltage/current  |
| A/D conversion method          | Double integral method  |
| Sampling period                | 2.5 times/s   |
| Display refresh period         | 2.5 times/s   |
| Max. displayed digits          | 3 1/2 digits ( $\pm$ 1999)  |
| Display                        | 7-segment red LED   |
| Decimal point display position | By short-circuiting terminals   |
| Sign display                   | "-" is displayed automatically with a negative input signal               |
| Overflow/underflow display     | Overflow: #□□□<br>Underflow: - #□□□                                       |
| Zero suppression               | Not supported.  |
| External control               | Process value hold (terminals on rear panel short-circuited)              |
| Degree of protection           | Front panel: IEC IP51 (see note)<br>Case: IEC IP20<br>Terminals: IEC IP00 |

**Note:** IP51 is maintained when the water-resistant soft cover and bracket are used. IP50 will be, however, maintained without these water-resistant accessories.

## Measuring Ranges

| Input range | Measuring range | Max. resolution | Input impedance | Accuracy          | Max. permissible load |
|-------------|-----------------|-----------------|-----------------|-------------------|-----------------------|
| DC voltage  | ±199.9 mV       | 100 μV          | 100 MΩ          | ±0.1%rdg ±1 digit | ±250 V                |
|             | ±1.999 V        | 1 mV            | 100 MΩ          | ±0.1%rdg ±1 digit | ±250 V                |
|             | ±19.99 V        | 10 mV           | 10 MΩ           | ±0.1%rdg ±1 digit | ±250 V                |
|             | ±199.9 V        | 100 mV          | 10 MΩ           | ±0.1%rdg ±1 digit | ±350 V                |
| DC current  | ±199.9 μA       | 100 nA          | 1 kΩ            | ±0.1%rdg ±1 digit | ±10 mA                |
|             | ±1.999 mA       | 1 μA            | 100 Ω           | ±0.1%rdg ±1 digit | ±50 mA                |
|             | ±19.99 mA       | 10 μA           | 10 Ω            | ±0.1%rdg ±1 digit | ±150 mA               |
|             | ±199.9 mA       | 100 μA          | 1 Ω             | ±0.1%rdg ±1 digit | ±500 mA               |
|             | ±1.999 A        | 1 mA            | 0.1 Ω           | ±0.3%rdg ±1 digit | ±3 A                  |

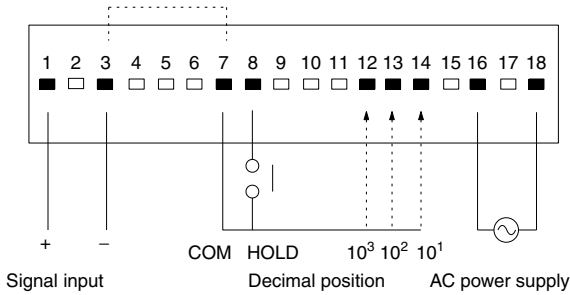
Note: The above accuracy is at an ambient temperature of 23±5°C.

## Connections

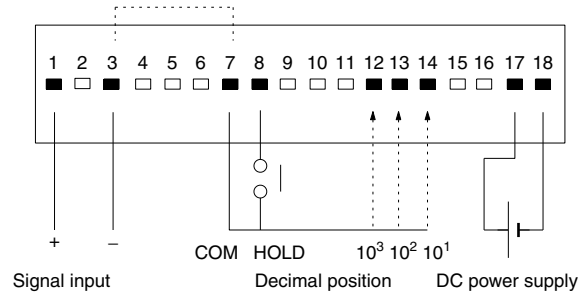
### External Connections

Connector and connector screws are provided with the model.

#### AC Power Supply



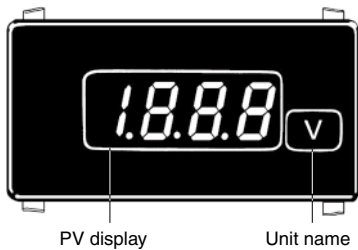
#### DC Power Supply



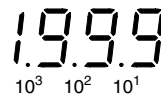
Note: 1. Terminals 3 and 7 of the AC and DC models are not internally insulated. Connect a relay with high contact reliability and insulation (with a minimum load current of 0.3 mA) or a photocoupler with high insulation (with a residual voltage of 1 V max. and a current leakage of 0.1 mA max.) to these terminals for external control.

2. The terminals marked with a white rectangular box are not used. Do not use these terminals for transmission of signals.

## Nomenclature

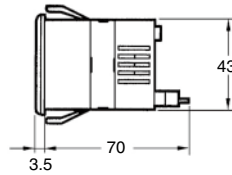
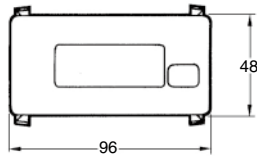
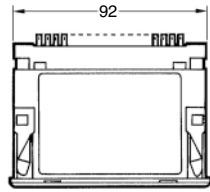
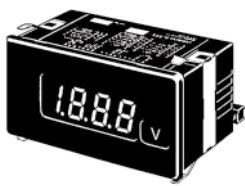


Select the decimal position with terminal 12, 13, or 14 on the rear panel.

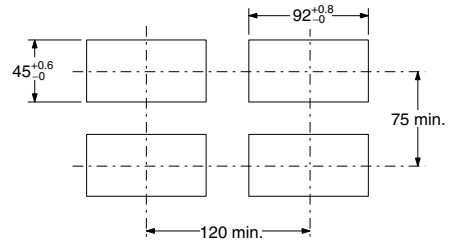


# Dimensions

Note: All units are in millimeters unless otherwise indicated.

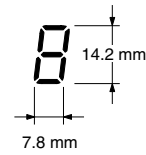


## Panel Cutouts



Note: The values above are recommended values. Do not group-mount the meters at intervals less than the recommended ones.

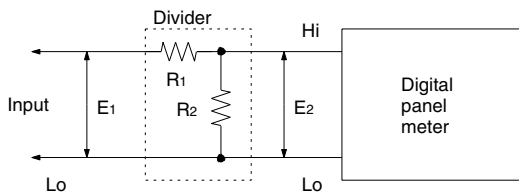
## LED Indicator Size



# Application Examples

## High DC Voltage Measurement

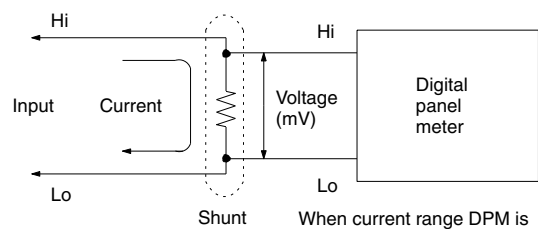
When voltage exceeding the maximum voltage in the standard range is measured (for example: more than 200 V), a divider is connected externally.



$$\frac{E_2}{E_1} = \frac{R_2}{R_1 + R_2}$$

## Large DC Current Measurement

When large DC current exceeding 2 A is measured, a shunt is connected externally.



When current range DPM is used, disconnect the internal shunt resistor.

# Safety Precautions

## Mounting

Recommended panel thickness is 1 to 3.2 mm.

When mounting, insert the Digital Panel Meter in the mounting hole and make sure that the Digital Panel Meter is secured with mounting hooks.

Always attach the Mounting Bracket before wiring the terminals. Also, always remove the wiring before removing the Mounting Bracket.

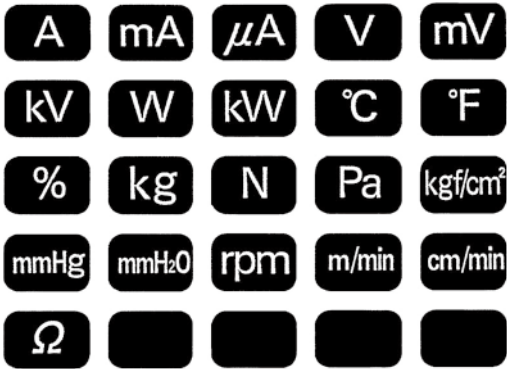
Mount the Digital Panel Meter as horizontally as possible.

Never use the Digital Panel Meter in locations where corrosive gas (particularly sulfide or ammonia gas) is generated.

As much as possible avoid use of the Digital Panel Meter in a location subject to severe shock or vibration, excessive dust, or excessive moisture.

Select a mounting location where the Digital Panel Meter can be used at an ambient operating temperature  $-10^{\circ}$  to  $55^{\circ}\text{C}$ .

No product is shipped with the unit label attached. Select a unit label from the sheet provided, and attach it to the Digital Panel Meter.



## Calibration

Calibrate the Digital Panel Meter regularly so that the Digital Panel Meter can maintain processing accuracy.

Use a standard signal generator with an accuracy of 99.99% min. for calibration.

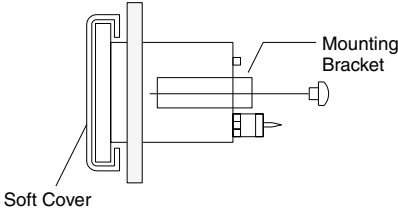
For the precise calibration methods, refer to the Instruction Sheet for the Digital Panel Meter.

After the front panel cover is removed to calibrate the K3TE, be sure not to touch components other than the calibration adjuster. Keep metal objects off the K3TE while calibrating, especially when power is turned on.

## Accessories (Order Separately)

### Water-resistant Soft Front Cover

Before mounting the Digital Panel Meter to a panel, attach the water-resistant soft front cover and mounting bracket to the Digital Panel Meter properly so that the Digital Panel Meter will maintain IP51 water-resistant standards. Before you calibrate Digital Panel Meters, remove the water-resistant soft front cover. Refer to the operation manual included with the Digital Panel Meter for the calibration procedure.



**Note:** Be sure to use the Water-resistant Soft Front Cover and mounting bracket together.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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